Water Quality Trading & Adaptive Management Training

Available Guidance

Adaptive Management Technical Handbook

Released: 01/07/2013

http://dnr.wi.gov/topic/SurfaceWater/AdaptiveManagement.html

(topic keyword: "adaptive management")

Implementing Water Quality Trading in WPDES Permits

Released: 08/21/2013

Water Quality Trading How-To Manual

Released: 09/09/2013

http://dnr.wi.gov/topic/SurfaceWater/WaterQualityTrading.html

(topic keyword: "water quality trading")

Compliance Options Available

- Facility upgrade
  - Minor operational changes
  - Construct significant new or upgraded treatment
  - Change industrial processes (industrial facilities)
- Water quality standards variance
  - Individual
  - Statewide?
- Water quality trading
- Adaptive management

When to Select Facility Upgrade

- You can comply with WQBEL through:
  - Optimization
  - Minor operational changes
  - Minor process changes

- A major facility upgrade is needed, but…
  - Facility needs to be updated anyway
  - Cost can be easily absorbed
  - Construction cost = AM/WQT costs
  - Can't spend money outside your municipal boundary

Variances- Individual

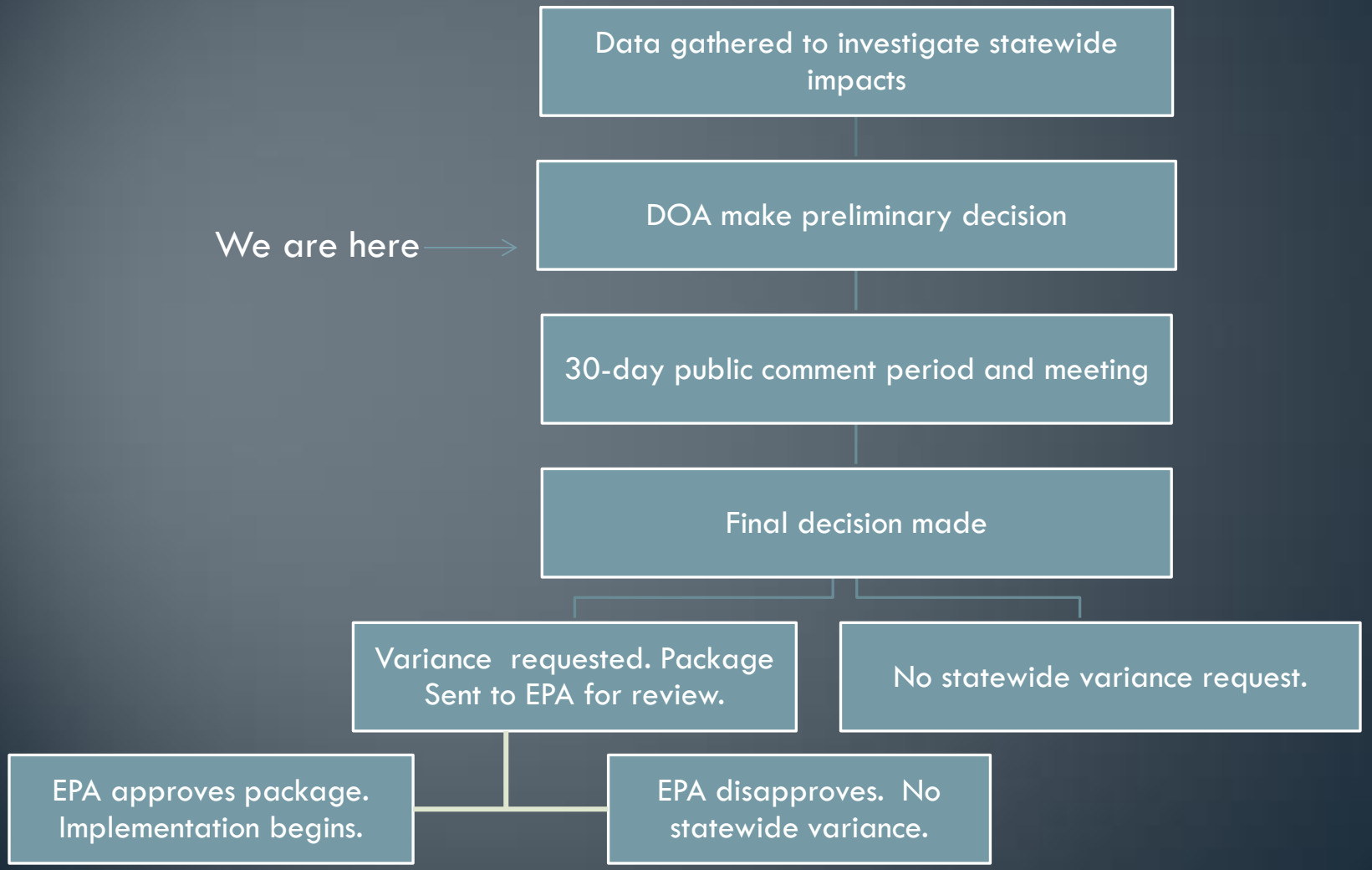
283.15(4)(a)1

a. Naturally occurring pollutant
b. Water levels prevent
c. Human caused conditions
d. Dams
e. Physical conditions
f. Economic impacts

Possible Statewide Variance

- Act 378 was passed April 2014 to investigate a statewide TP variance
- DOA and consultation with DNR to make social and economic determination
- EPA must approve variance before it becomes available
  - Productive discussions with EPA continue

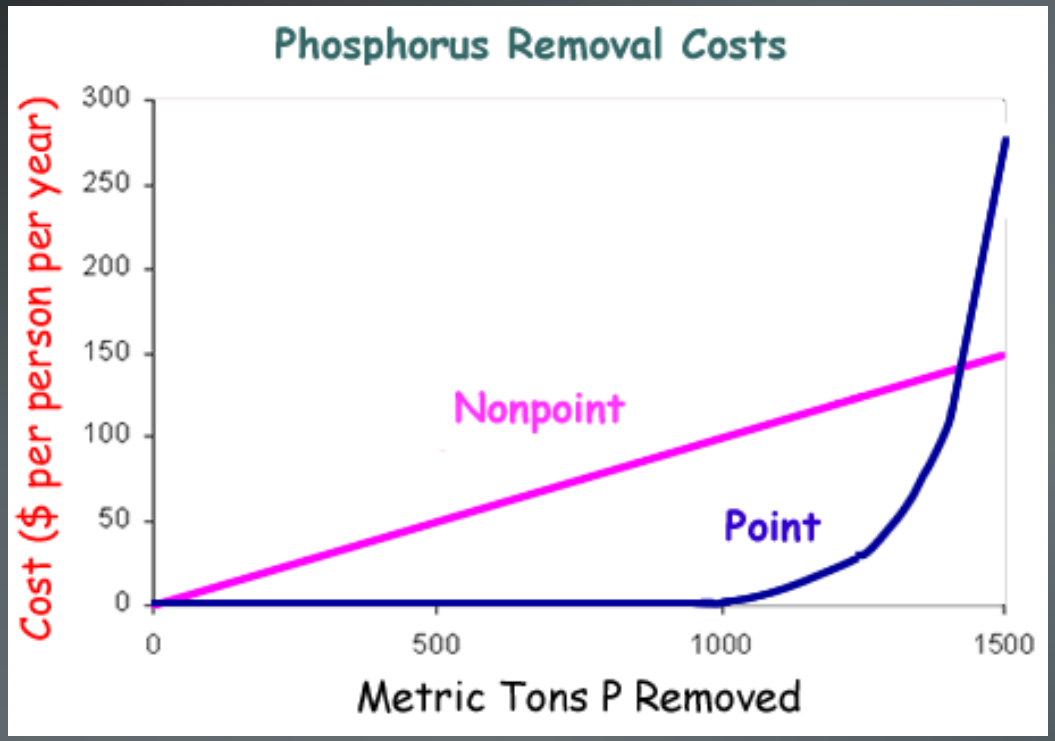
Process before statewide variance is available



Minimum application materials

1. Certification that a point source cannot achieve compliance without a major facility upgrade
2. Point source can comply with interim limits:
   - First permit- 0.8 mg/L
   - Second permit- 0.6 mg/L
   - Third permit- 0.5 mg/L
   - Fourth permit- WQBEL
3. Point source will implement a watershed project:
   - Annual payments to county LCD ($50/lb)
   - Other DNR-approved projects

Economic principle for AM/WQT



- Optimization breakpoint for treatment.
- This graph assumes linear costs for nonpoint source control which is likely not the case and a commonly made mistake.

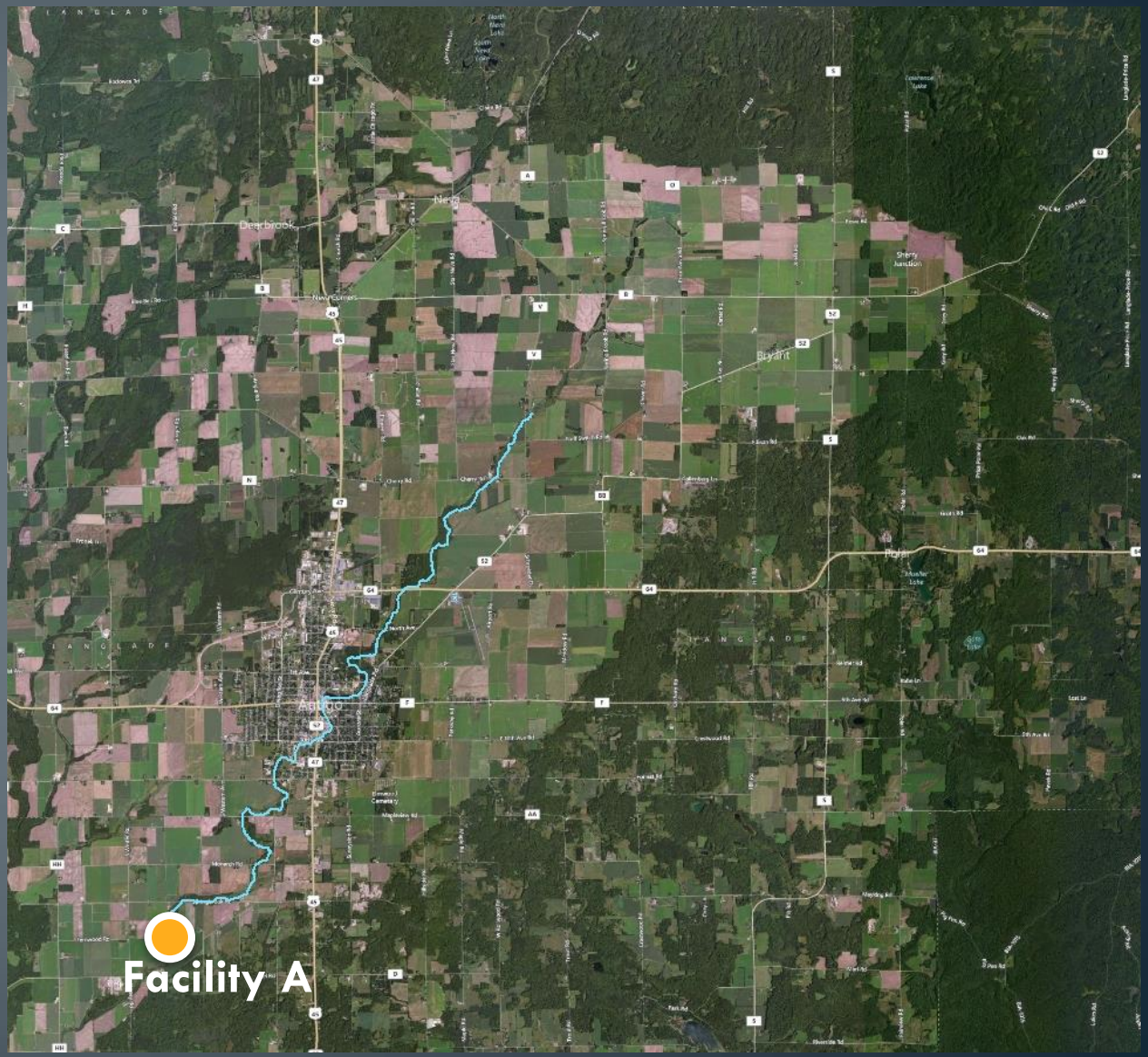
Source: Michigan Environmental Education Curriculum

A Closer Look at Water Quality Trading

- End of pipe pollutant offset
- Water quality trading is an exchange of pollutant reduction credits (i.e. “credits”)
- A buyer with a high pollutant control cost can purchase pollutant reduction or treatment from a willing seller
  - Sellers can include other points sources, including permitted MS4s, and nonpoint sources such as private landowners and non-permitted MS4s.
- Buyer applies credits towards compliance with a permit limit

Example:

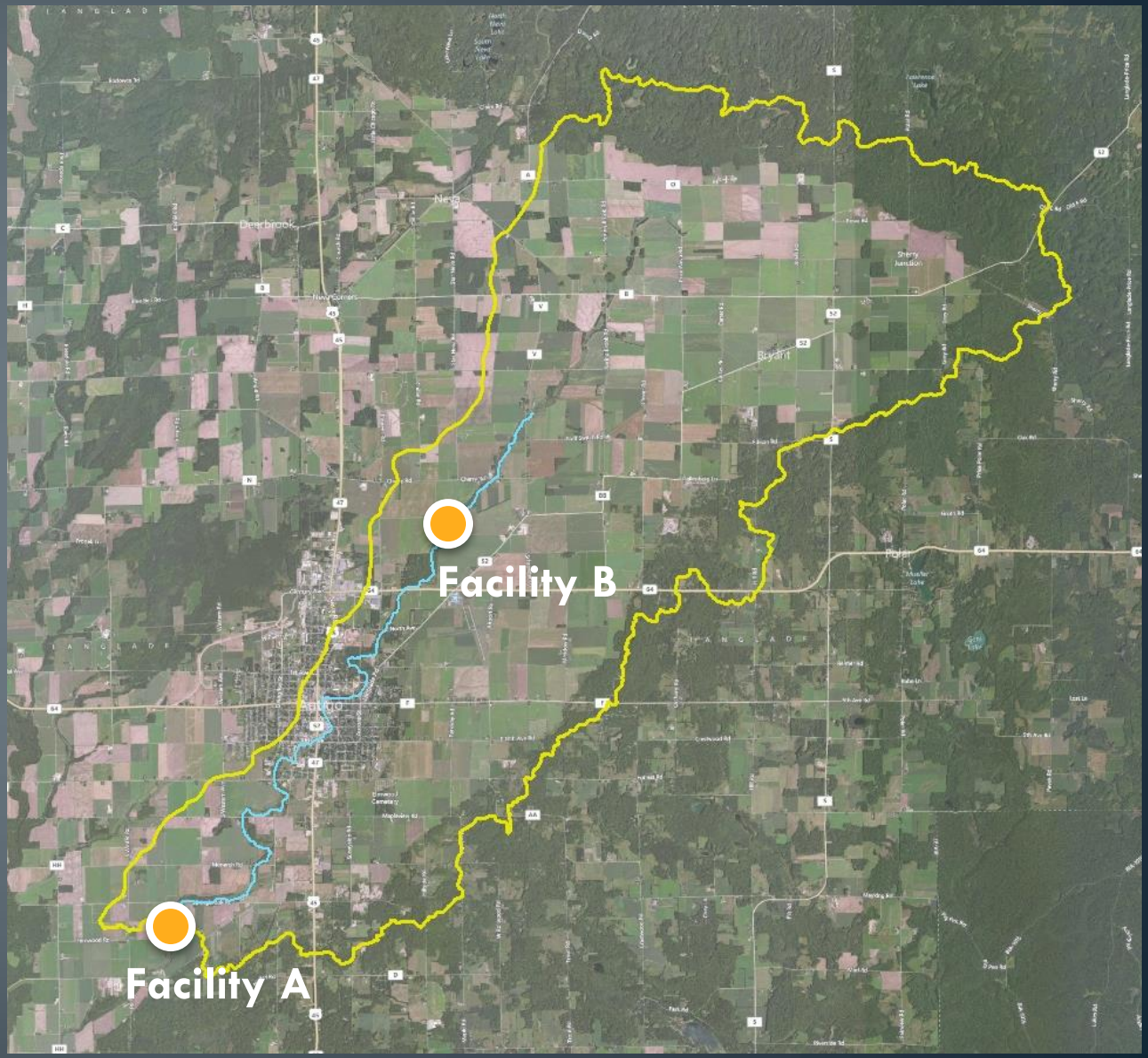
- Facility A has a phosphorus WQBEL equal to 0.075 mg/L. They need offset 250 lbs of P/mo to comply.



Example:

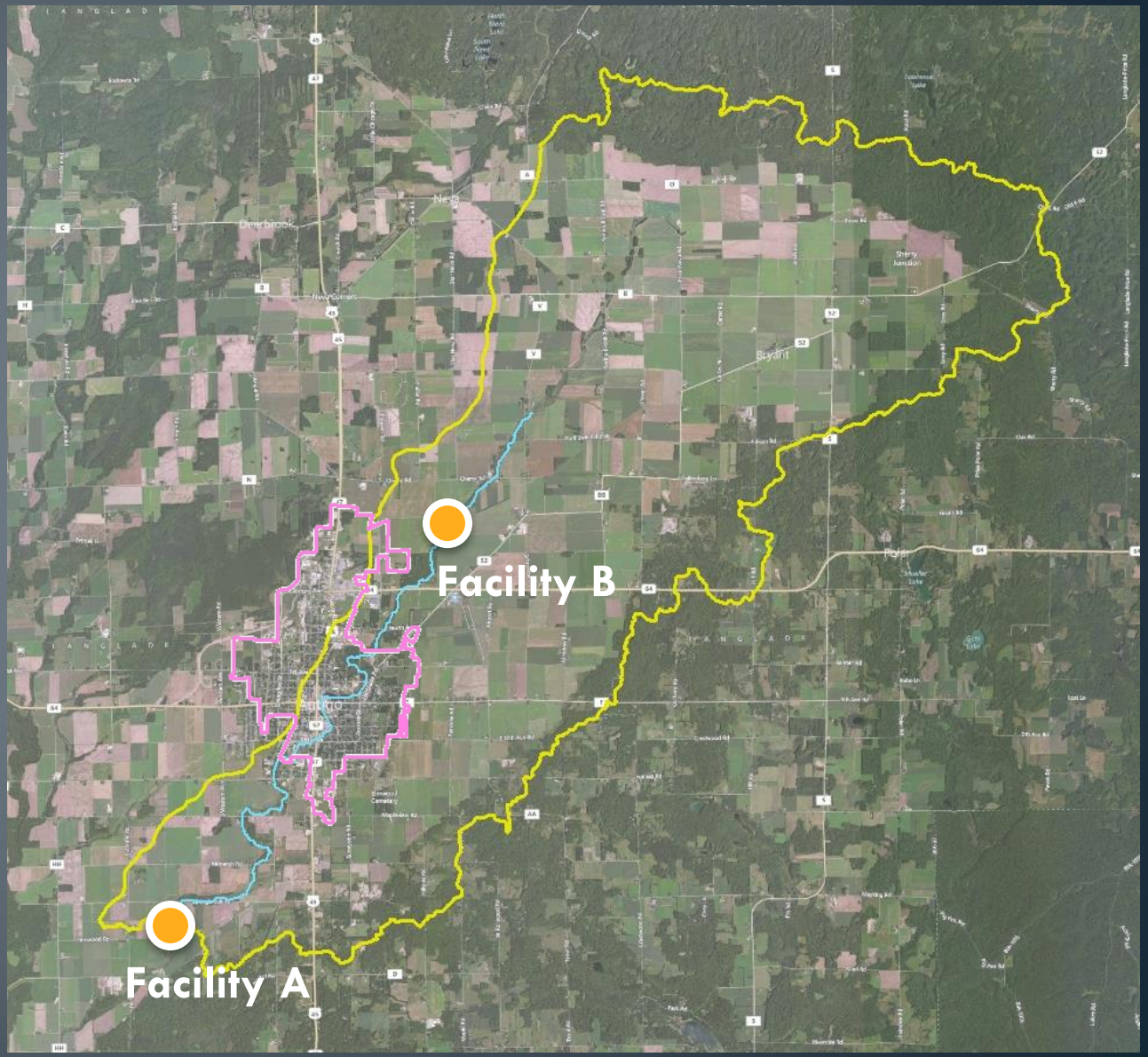
- Facility A has a phosphorus WQBEL equal to 0.075 mg/L. They need offset 250 lbs of P/mo to comply.

- Facility B adds treatment to comply with their own permit limits and is able to sell 100 lbs of P/mo to Facility A.



Example:

- Facility A has a phosphorus WQBEL equal to 0.075 mg/L. They need offset 250 lbs of P/mo to comply.
- Facility B adds treatment to comply with their own permit limits and is able to sell 100 lbs of P credit/mo to Facility A.
- Facility A also works with a non-permitted urban area to implement of series of practices in the watershed to buy 150 lbs of P credit/mo.



Keys to Trading

- Trade ratio is required to quantify credits to ensure trades result in water quality improvement
  - Minimum trade ratio is 1.2 : 1 for point to nonpoint source trades
  - Minimum trade ratio is 1.1 : 1 for point to point source trades
- Geographic extent
  - Trades should occur upstream of credit user
  - If downstream trades occur, they should occur within same HUC-12
    - Additional trade ratio factor apply
- Timing
  - Practices must be established and effective before they generate credit
  - Typically cannot take credit for past practices

Trade Ratio

- Uncertainty
  - Based on effectiveness and ease of verification of the management practices employed.
- Delivery (distance between generator and user)
  - Not necessary if within same HUC 12
- Downstream factor
  - Applies if credit generator is downstream of the point of standards application
- Equivalency (form of pollutant)
  - Not necessary with phosphorus
  - Not yet specified for N and TSS (sediment)

Trade Ratio – Uncertainty

Table 4. Management practices with recommended credit generation and use information.

Management Practice	Uncertainty Factor[1]	Applicable Technical Standard	Method for Calculating Pollutant Load Reductions	Notes
Nutrient Management and supporting practices:	2 (3)	NRCS 590	SNAP-Plus or equivalent model results compared to baseline	An approved NMP is required with any of the listed supporting practices. All supporting practices receive the same uncertainty factor as the NMP. An uncertainty factor of 2, instead of (3), may be used when documentation can be provided through historic cropping records or soil testing that nutrient levels are stable or dropping, an indication of adherence to the NMP. An uncertainty factor of (3) is required if fields are not brought into compliance with NR 151.02 and NR 151.04, Wis. Adm. Code. No application of manure, biosolids or industrial wastes allowed on snow-covered or frozen ground or on fields with high groundwater or tile drainage. A crop or livestock producer engaged in a trade agreement must have all fields under an approved NMP, not just fields engaged in the trade. Use of **grassed waterways** on fields in support of nutrient management and other supporting practices lowers the uncertainty factor to 1.5.
Tillage Options				
Mulch Till	2 (3)	NRCS 345		
No Till	2 (3)	NRCS 329		
Riparian Filter Strip (edge of field)	2 (3)	NRCS 393		
Grassed Waterway	See Notes	NRCS 412		
Cover Crop	2 (3)	NRCS 340		
Other practices simulated in SNAP-Plus	2 (3)			
Production Area Practices			University of Wisconsin Barnyard Tool APLE or equivalent modeling method	
Diversion	2	NRCS 362		
Roof Runoff Structure	2	NRCS 558		
Vegetated Treatment System	4	NRCS 635		
Constructed Wetland	4	NRCS 656		
Sediment Control Basin	2	NRCS 350	RUSLE2	For agricultural runoff control.
Streambank Stabilization and Shoreline Protection			Contact WDNR to discuss project and develop a method to quantify impact of stabilization. Appropriate methods include NRCS regression calculation.	For livestock producers, streambank stabilization must be accompanied by riparian fencing or other controls to prevent destruction of streambanks.
Without aquatic habitat restoration	3	NRCS 580 NRCS 382		
With aquatic habitat restoration	2	NRCS 580 NRCS 395		

When to Select Trading

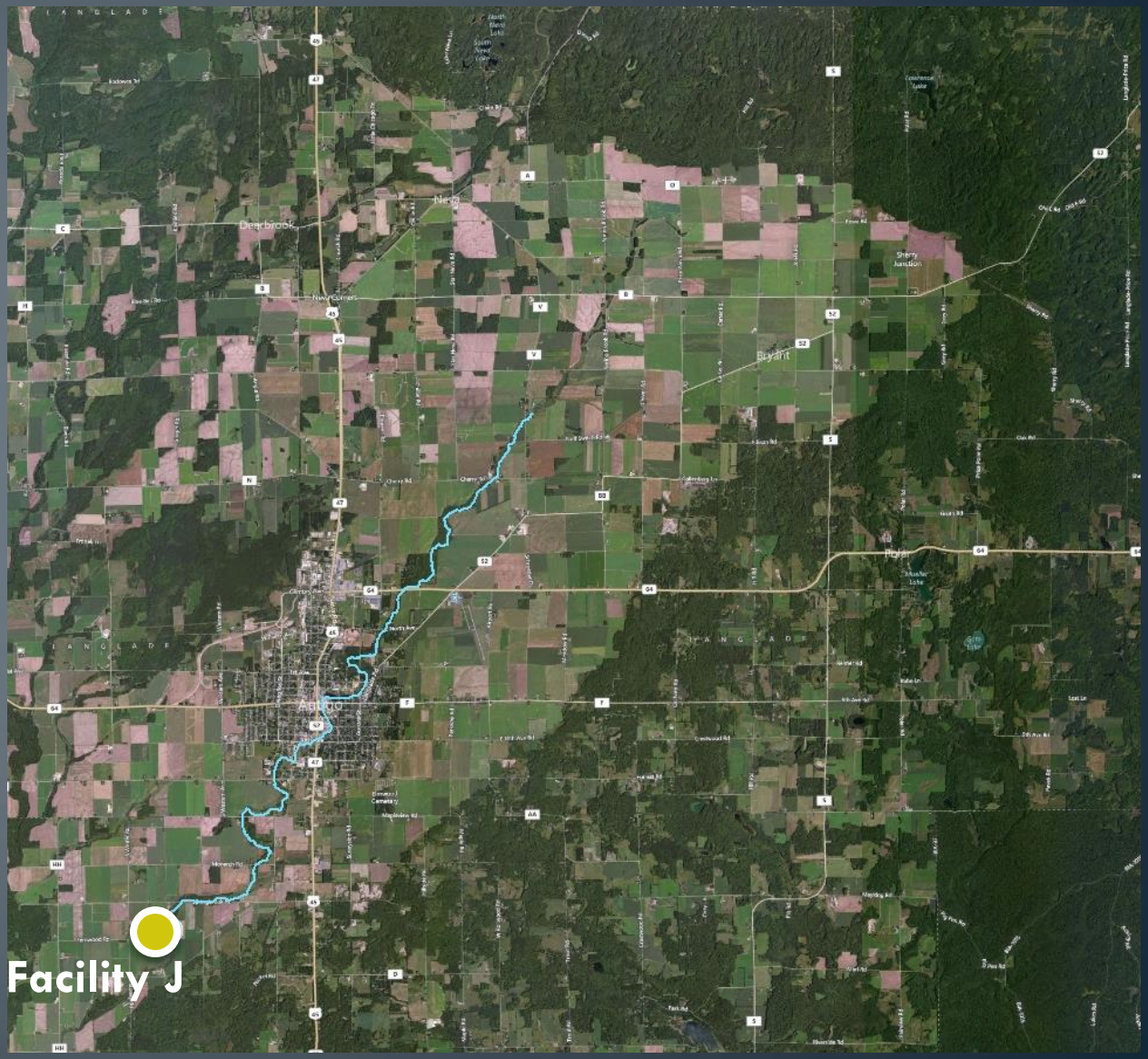
- Cost savings!
- Partnerships available to help find credits (PS, NPS)
  - Large area to find credits
- Small amount of mass to offset
- Relatively easy to find credits
- Plenty of credits to offset load
- Sufficient time available to find and establish trades
- Others?

A Closer Look at Adaptive Management

- Compliance option focusing on water quality improvements
- Allows point sources to work with other sources of phosphorus in the watershed
- Goal: To reduce overall phosphorus loads so that **water quality criteria** can be attained
- NR 217.18, Wis. Adm. Code

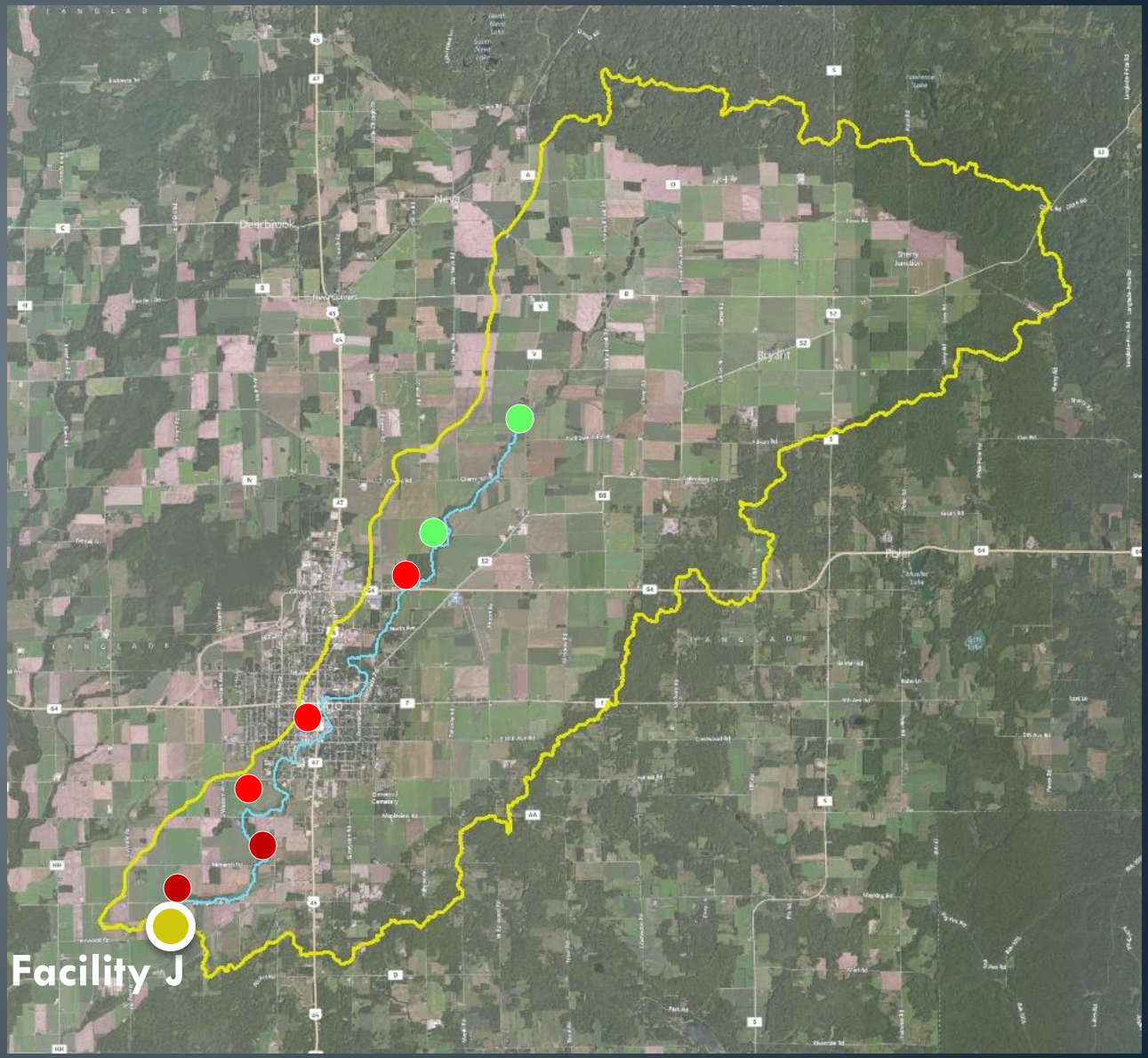
The Concept:

- Facility J has a phosphorus WQBEL equal to 0.075 mg/L.



The Concept:

- Facility J has a phosphorus WQBEL equal to 0.075 mg/L.
- The receiving water is exceeding the phosphorus criteria.



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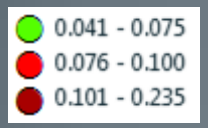
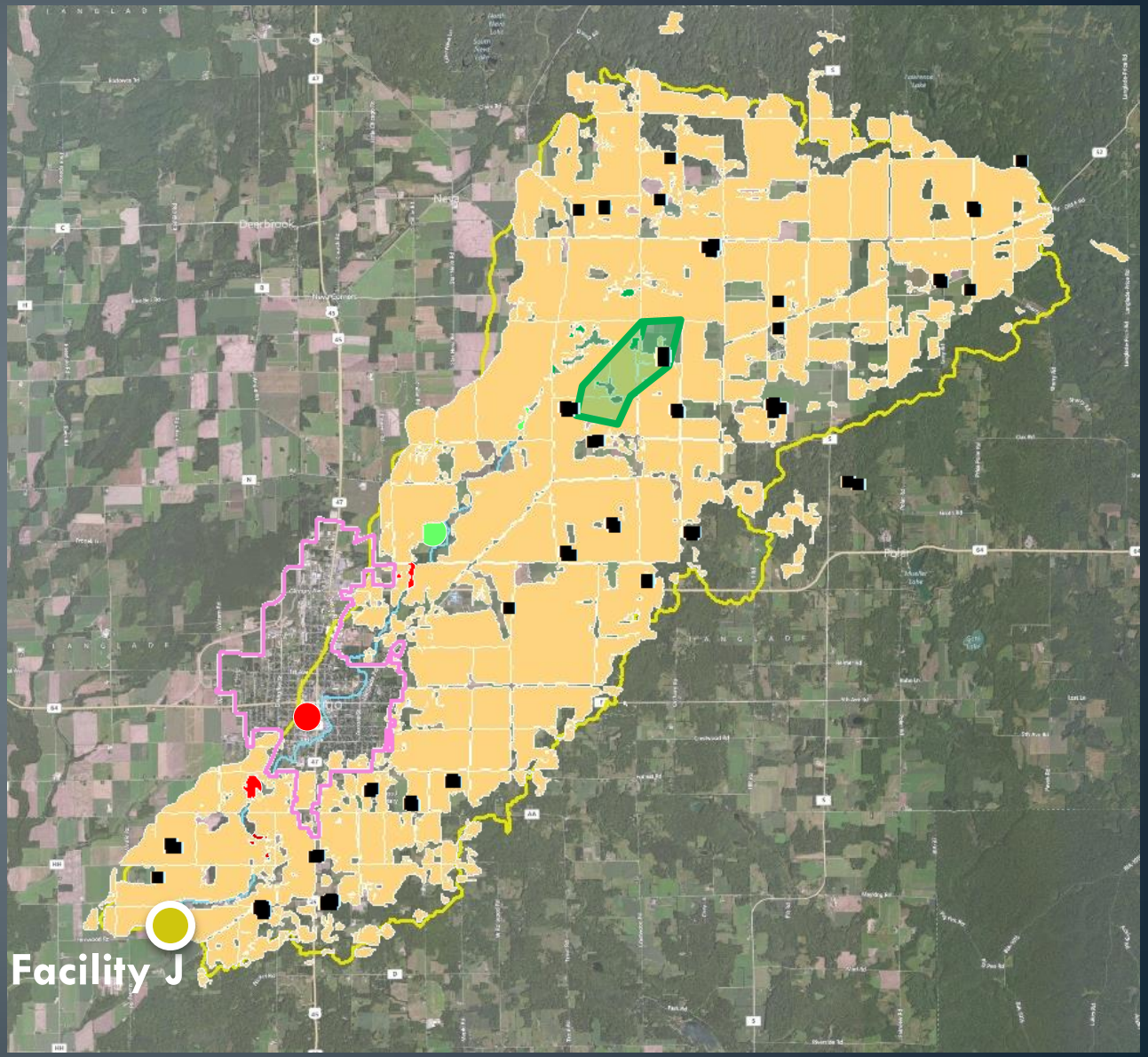


- A watershed plan is developed to improve water quality and reduce sources of P from:
  - Barnyards
  - Urban areas
  - Cropland
  - Natural features
  - Other



Keys to Adaptive Management

- Adaptive management has about a 15 year project life
- Less restrictive interim limits are included in permit instead of the restrictive WQBEL
- In-stream monitoring required
- Adaptive management can be rolled over into water quality trading if insufficient water quality improvements are demonstrated

Permit term 1	• 0.6 mg/L
Permit term 2	• 0.5 mg/L
Permit term 3	• Revised WQBEL

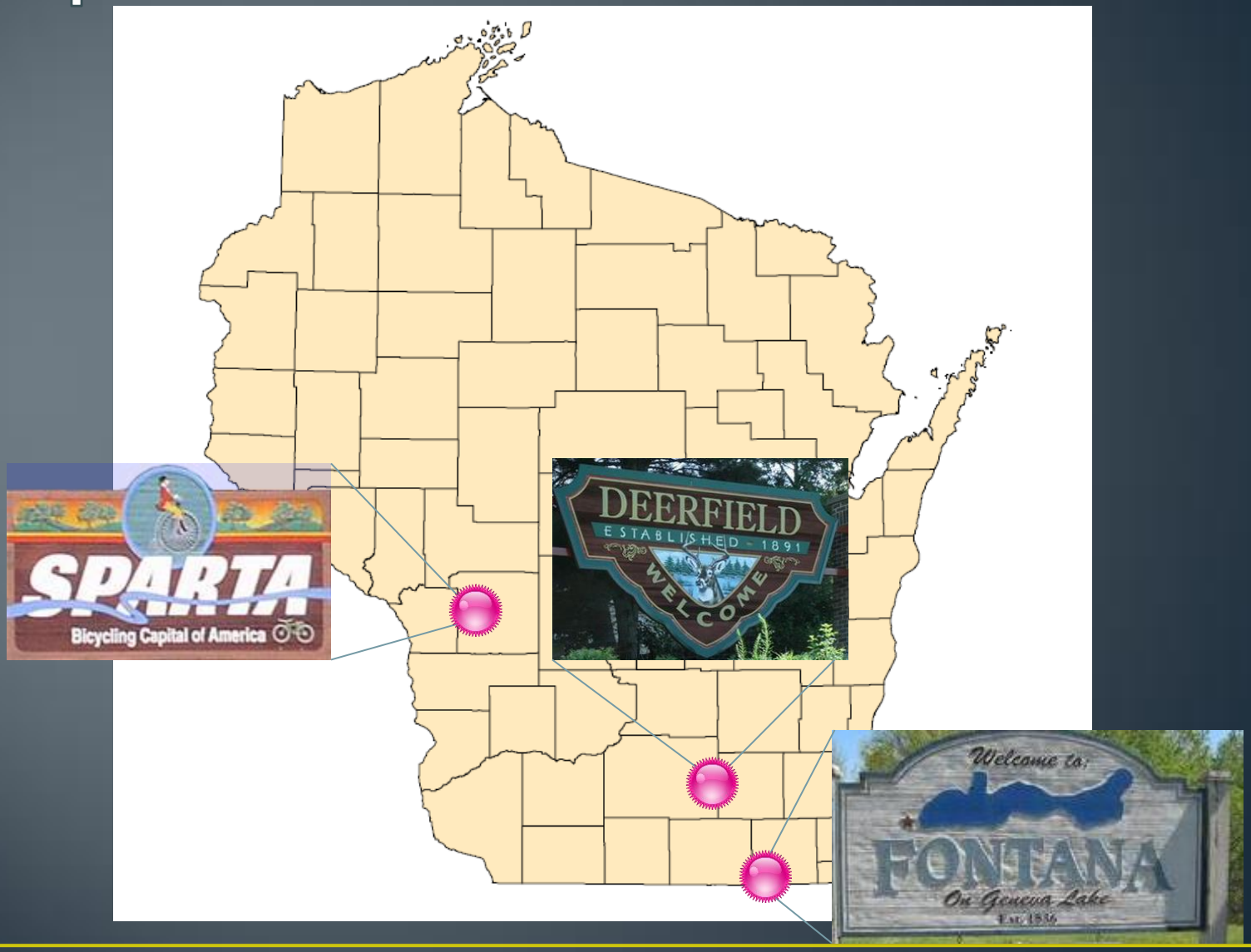
When to Select AM

- Cost savings!
- Multiple partners are available/interested
- WQ improvements anticipated
- Need time
- Baseline monitoring data available
- Cannot qualify for variance
- Potential fewer offsets than trading

Comparing Adaptive Management to Trading

	Adaptive Management	Trading
Pollutants Covered	TP (and possibly TSS)	All pollutants except BCCs
End Goals	Attaining the water quality criteria	Offsetting the limit
Offsets	No trade ratios	Trade ratios apply
Timing	Implemented throughout the permit term	Generating credits as they can be used
In-Stream Monitoring	Required	Not required
Level of Documentation Needed	General watershed information	Field-by-field documentation

Examples


SPARTA
Bicycling Capital of America
DEERFIELD
ESTABLISHED - 1891
WELCOME
Welcome to:
FONTANA
On Geneva Lake

Sparta WWTF

- Design flow: 2.2 MGD
- Discharges to La Crosse River
  - In-stream TP concentration= 0.09 mg/L
  - PS:NPS ratio= 1:99
- Final Limit
  - 0.075 mg/L, six-month average
  - 0.225 mg/L, monthly average
- Offset needed for WQT
  - 2130 lbs/yr –510 lbs/yr = 1620 lbs/yr

Current load [lbs/yr] − Final limit [lbs/yr] = Offset Needed [lbs/yr]

AM vs. WQT

Water Quality Trading

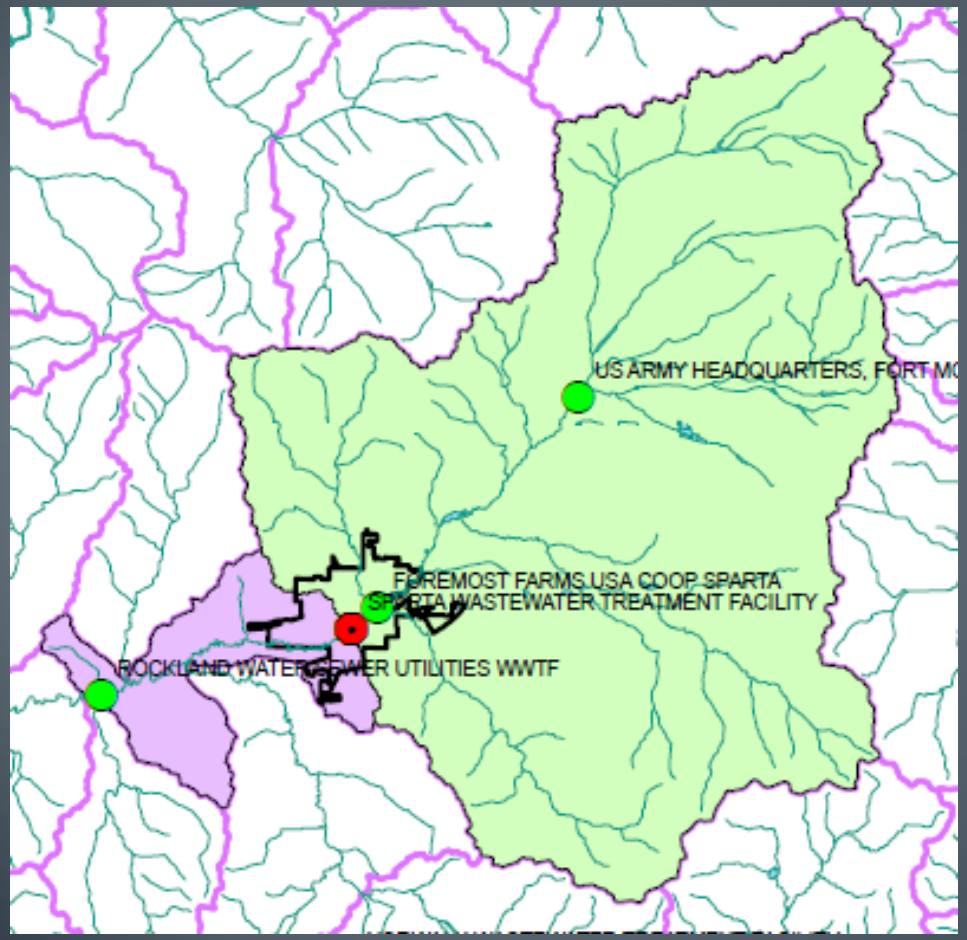
- Trade Ratio (assume 2:1)
- Total credits: 3,240 lbs/yr

Adaptive Management

- In-Stream: 0.09 mg/L
- Total Reductions Needed: 1,661 lbs/yr
- 20 years
- Can meet interim limit

Sparta WWTF: 2130 lbs/yr –510 lbs/yr = 1620 lbs/yr

Logistics



- Possible TP Reductions
  - Storm water projects
  - Ag. projects near municipal boundary
- Politically viable
  - Economically efficient
  - Keeping funds within municipal boundary

Status

- Sparta NOI approved
- First installment of WQT plan submitted and approved
- Second installment coming 2015?
- LEAD STAFF: Mike Vollrath and Julia Stephenson

Fontana Walworth

- Design flow: 1.774 MGD
- Discharges to Piscasaw Creek
  - In-stream TP concentration= ???
  - PS:NPS ratio= 72:28
- Final Limit
  - 0.075 mg/L, six-month average
  - 0.225 mg/L, monthly average
- Offset needed
  - 2080.5 lbs/yr – 277.4 lbs/yr = 1803.1 lbs/yr

Current load [lbs/yr] − Final limit [lbs/yr] = Offset Needed [lbs/yr]

AM vs. WQT

Water Quality Trading

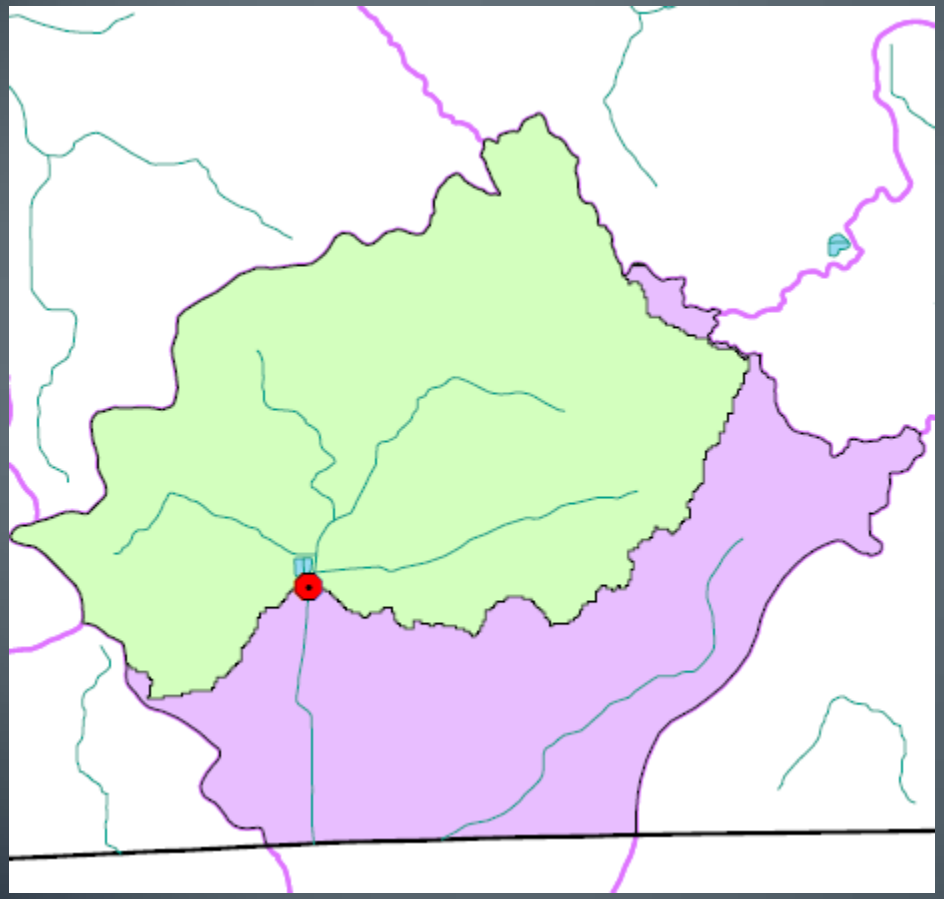
- Trade Ratio (assume 2:1)
- Total credits: 3,606.2 lbs/yr

Adaptive Management

- 20 [illegible]ars
- Can [illegible]

Fontana Walworth WWTF: 2080.5 lbs/yr – 277.4 lbs/yr = 1803.1 lbs/yr

Logistics



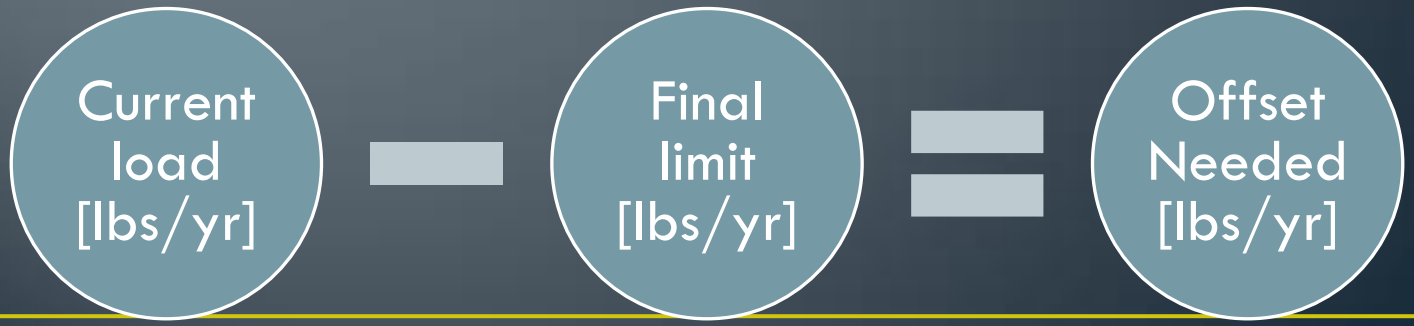
- Possible TP Reductions
  - Biosolid spreading adjustments
  - Ag. detention pond project
- Politically viable
  - Economically efficient
  - Working on-site
  - Working with existing NPS partnerships

Status

- Calculating possible reductions
  - P Trade Report in SNAP+
- NOI due 4/30/2016
- LEAD STAFF: Mike Luba

Deerfield WWTF

- Discharges to a tributary of Mud Creek
- Design flow: 0.393 MGD
- Final Limit
  - 0.075 mg/L, six-month average
  - 0.225 mg/L, monthly average
- Offset needed
  - Design: 610 lbs/yr –90 lbs/yr = 520 lbs/yr



AM vs. WQT

Water Quality Trading

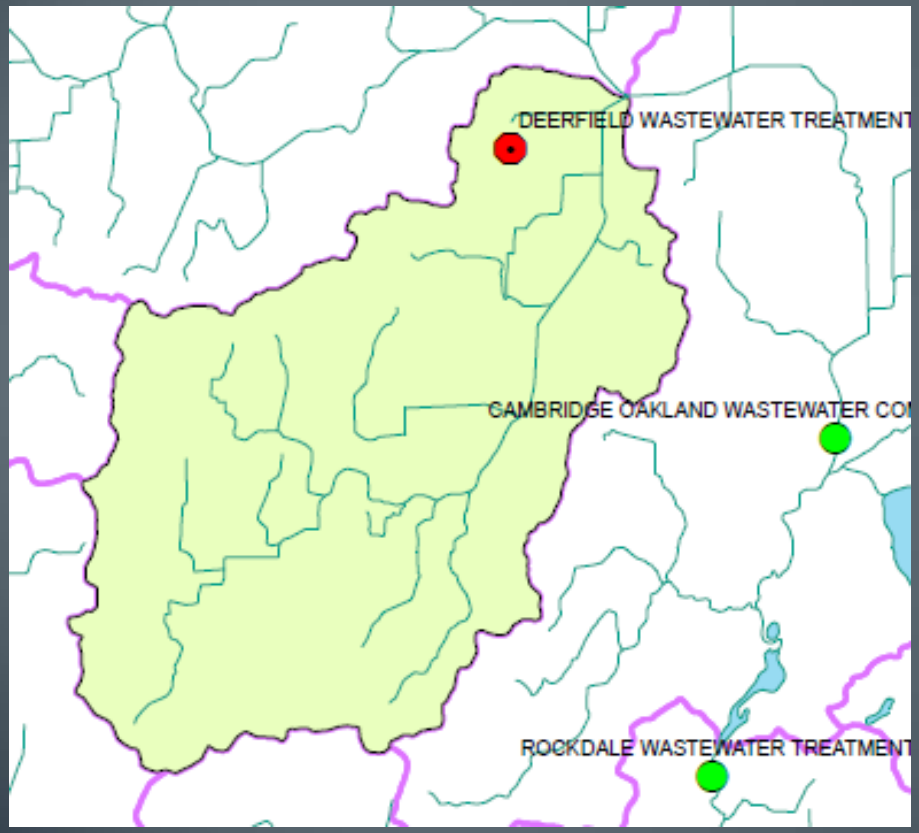
- Trade Ratio (assume 2:1)
- Total credits: 1040 lbs/yr

Adaptive Management

- In-Stream: 0.09 mg/L
- Total Reductions Needed: 680 lbs/yr
- 20 years
- Can meet interim limit

Deerfield WWTP: 610 lbs/yr – 90 lbs/yr = 520 lbs/yr

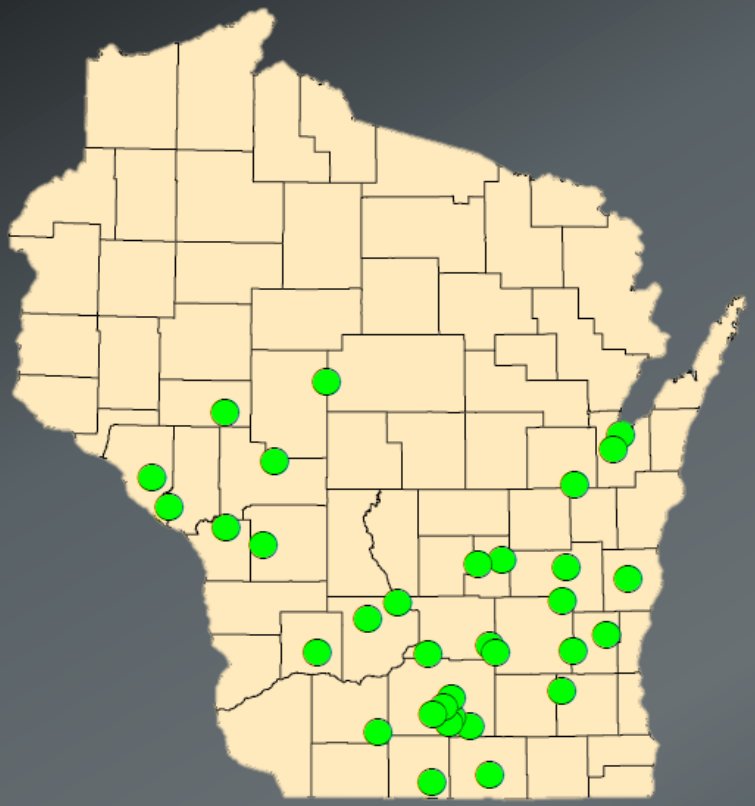
Logistics



- Possible TP Reductions
  - Working to determine now
- Likelihood of measuring in-stream TP reductions
  - Simple watershed
  - Near criteria currently
- Politically viable
  - Economically efficient

Status

- Investigating Options
- AM Request Form due 9/30/2016
- LEAD STAFF: Amy Garbe



Coming together is a beginning; keeping together is a process; working together is success.

~Henry Ford

Questions?

Location	Contact Information	DNR Office/Email
Statewide coordinators	Amanda Minks, Kevin Kirsch, Mike Hammers, Andrew Craig	Amanda.Minks@Wisconsin.gov Kevin.Kirsch@Wisconsin.gov Andrew.Craig@Wisconsin.gov
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http://dnr.wi.gov

keywords: “adaptive management”, “water quality trading”